

THE SCORPIONS OF CALIFORNIA

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The scorpions are readily known from all other arachnids by the presence of two peculiar characters; the body terminates in a poison sting, and on the venter, near the base of the abdomen is a pair of appendages (Fig. 80, d), each bearing a number of lamellae; these are the pectines, or combs. The palpi are enlarged at tip and chelate, the claw being of three parts; the hand, or basal portion, and two fingers, one movable, the other fixed. There are three groups of eyes on the anterior part of the cephalothorax, one median of two, and a lateral group at each anterior corner, of two or three eyes. The last five segments of the body are much narrower than the others, and form the cauda, or tail; the last segment is the "vesicle," and bears the sting. These caudal segments bear ridges, which are called "keels." The legs have no patella between femur and tibia. The mandibles in front consist of a basal part, or paturon, (Fig. 80, f), and two curved fingers, one fixed and one movable; these fingers are usually provided with teeth. Beneath on the venter is a small triangular or pentagonal area between the posterior coxæ; this area is the sternum.

The poisonous nature of scorpions has been exaggerated by most people; the commoner forms are no more dangerous than a wasp; one species, *Centrurus exilicauda*, which occurs in western Mexico and up into the southern part of California, is considered by some to be more poisonous than other species; however, there is little evidence, as yet, on this matter.

The species so far known to occur in California are distinguished in the following table:

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|---|----------------------------------|
| 1. Between tarsus and metatarsus is a single spur (on anterior side); sternum pentagonal; cephalothorax deeply emarginate in front; cauda very small; fingers shorter than hand; pectines rarely more than 12 in number | 2 |
| Between tarsus and metatarsus are a pair of spurs, one in front, one behind | 3 |
| 2. No tooth below sting; hand longer than broad; pectines not more than seven | <i>Opisthacanthus lepturus.</i> |
| A tooth below sting; hand as broad as long; pectines about 10; surface of cephalothorax finely granulate..... | <i>Diplocentrus keyserlingi.</i> |
| 3. Sternum long, triangular, with converging sides; immovable finger of mandibles with lower tooth | 11 |
| Sternum short, pentagonal; immovable finger of mandibles without lower tooth; no tooth below the sting | 4 |
| 4. With but two lateral eyes; stigmata oval; with about 7 pectines; hand very broad; small, short species..... | <i>Brotchoactas allenii.</i> |
| With three lateral eyes; stigmata more elongate, usually slit-like..... | 5 |

- 5. A large tooth on lower edge of movable finger of mandibles; long hairs on legs and pedipalpi; about 30 pectines, or more; last dorsal segment without distinct keels; all caudal segments with keels below; fingers of hand longer than hand (Fig. 81, F D).....*Hadrurus hirsutus*.
No such tooth on movable finger of mandibles; less hairy forms; last dorsal segment more or less distinctly keeled..... 6
- 6. Middle lamellæ of pectines broken up into many small subequal sclerites; usually at least 15 pectines; colors rather pale..... 8
Middle lamellæ of pectines not broken up; pectines rarely more than 10 or 12; colors very dark..... 7

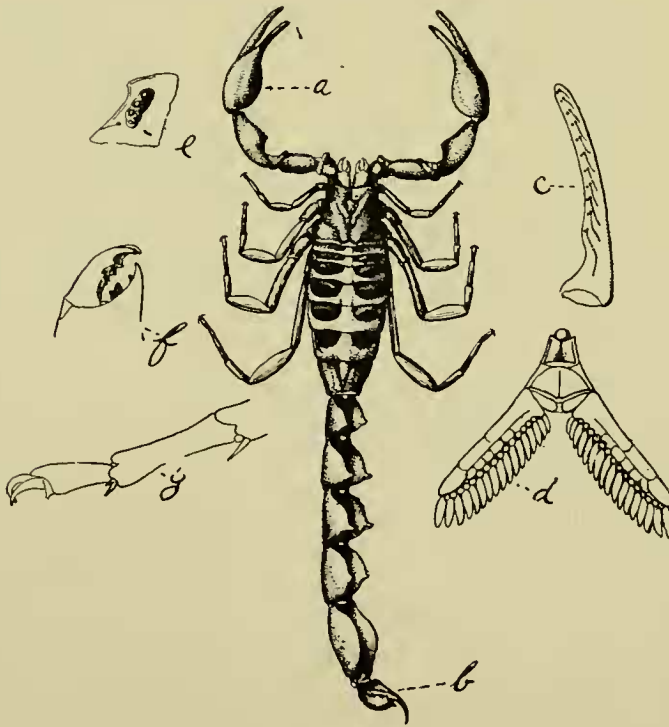


Figure 80. Anatomical details of a Scorpion.

- 7. Movable finger of mandible with at least 5 small teeth; stigmata rather short; fourth segment of cauda keeled below; about 10 or 12 pectines; sting of male normal. (Fig. 81, E).....*Uroctonus mordax*.
Movable finger of mandibles with not more than three small teeth; stigmata very slender; fourth segment of cauda without keels below; about 7 pectines; sting of male swollen near base. (Fig. 81, H).....
..... *Anuroctonus phaiodactylus*.

8. Hand with distinct ridges or keels, more or less granulate; on under side of second caudal segment the median keels are more or less distinct 9
 Hand without keels, smooth and rounded; under side of second caudal segment without keels, but indicated by black lines.....*Vejovis spinigerus*.
9. The median keels on cauda are strong and granulate, also on last segment of abdomen below; fingers but little longer than hand; cephalothorax in front of eyes granulate; the vesicle of male is densely long-haired. (Fig. 81, J).....*Vejovis hirsuticauda*.
 The median keels on cauda are weak and not granulate; vesicle of male not densely long-haired 10

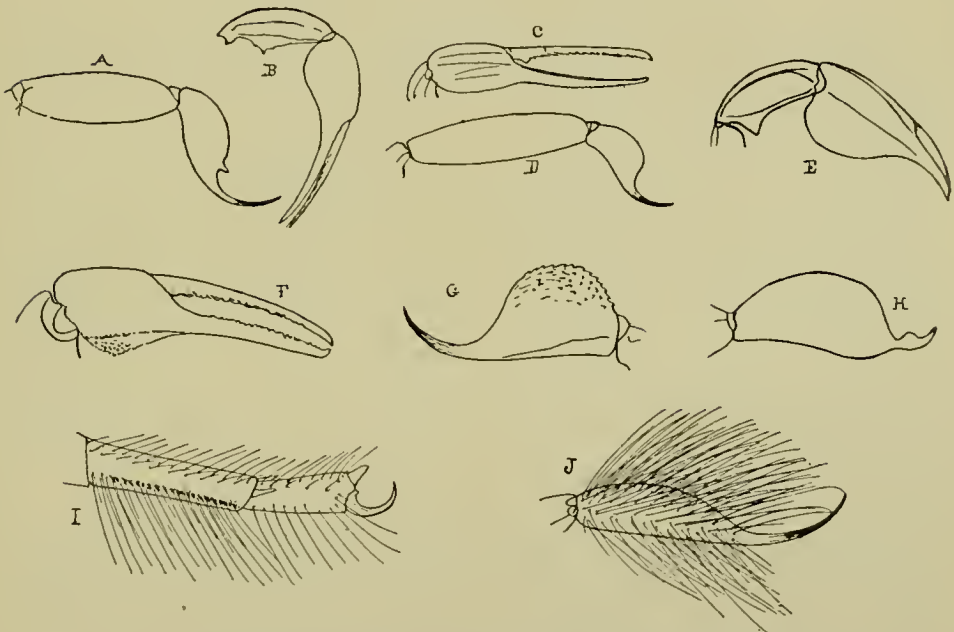


Figure 81. A, sting of *Centruroides californicus*; B, claw of same; C, claw of *C. exilicauda*; D, sting of same; E, claw of *Uroctonus mordax*; F, claw of *Hadrurus hirsutus*; G, sting of same; H, sting of *Anuroctonus phaidactylus*; I, tarsus of *Hadrurus hirsutus*; J, sting of *Vejovis hirsuticauda*.

10. Hand much longer than broad; fingers plainly longer than the hand; cephalothorax in front of eyes not granulate.....*Vejovis punctipalpi*.
 Hand nearly as broad as long; fingers barely longer than hand; cephalothorax in front of eyes granulate.....*Vejovis boreus*.
11. The rows of small teeth on the fingers of the claw are flanked by rows of similar teeth; about 16 to 25 pectines..... 13
 The rows of small teeth on the fingers of the claw are not flanked by rows of teeth, but sometimes these rows overlap..... 12

12. The rows of teeth overlap; fingers one and a half times longer than hand; no tooth under the sting; body mostly unicolorous.....
Tityus tenuimanus.
 The rows of teeth do not overlap; fingers twice as long as hand; a tooth under the sting; body and legs more or less maculate; cauda of male especially long.....*Isometrus maculatus.*
13. A distinct tooth below sting; fingers but one-fourth longer than hand; median keel of the fifth caudal segment reaching to tip. (Fig. 81, A B).....*Centrurus californicus.*
 No distinct tooth below sting; fingers one-half longer than hand; median keel of fifth caudal segment lost in the general granulation; cauda more slender. (Fig. 81, C D).....*Centrurus exilicauda.*

Opisthacanthus lepturus Pal de Beauv

This is a large, very dark-colored species, with very large claws, and a very small tail; it occurs in the American tropics, and has been taken from the islands off the Californian coast.

Diplocentrus keyserlingi Karsch

This is a Mexican species of which there are specimens in the Marx collection labelled "California." It is nearly black. There is another Mexican species closely similar in appearance, but with the cephalothorax smooth, not granulate; it is *D. whitei* Gerv., and may possibly be taken in California.

Broteochaetas allenii Wood

This is a small and short species, with large hand and very short fingers; it was described from Baja California, but I have seen specimens from Ft. Tejon, Calif.

Hadrurus hirsutus Wood

This is our largest species of scorpion; it is reddish yellow, or brownish, and unmarked; the legs and palpi are noticeably long-haired. Specimens have been seen from Indio, Tulare County, Salton, San Bernardino County, the Mohave Desert, and Palm Springs.

Uroctonus mordax Thorell

This is a very dark-colored species, with large claws, apparently rather common in central and northern California; specimens are from Lakeside, Lake Chabot, San Francisco, Fresno County, Sausalito, Camp Meeker, Sonoma County, Napa County, and Santa Rosa Island.

Anuroctonus phaidactylus Wood

This is rather larger than the last species, of a red-brown color, rather hairy, and peculiar on account of the swollen sting in the male. Specimens are from Witch Creek, and Cuyamaca Mountains, both in San Diego County, from the Mohave Desert, and Claremont.

***Vejovis punctipalpi* Wood**

A reddish brown species, with strongly ridged claw. Specimens from San Bernardino County, Death Valley, Santa Margarita Island, and San Diego County.

***Vejovis boreus* Girard**

This species is smaller than the last, and of more northern distribution, occurring in Washington, Idaho and Montana, but I have seen specimens labelled "California."

***Vejovis spinigerus* Wood**

This species is easily known by the smooth tail striped with black. Specimens are marked "California."

***Vejovis hirsuticauda* Banks n. sp.**

Reddish brown. Densely acutely granulate almost all over; granulate in front of eyes; four complete granulate keels on dorsum of last abdominal segment; the submedian keels below complete and widely separated; cauda slender, strongly keeled; beneath, the submedian keels are strong and granulate; the fifth segment is extremely long, one and three-fourths times as long as the fourth segment, keels strong to tip; the vesicle is very slender, and bears many very long hairs beneath, almost forming a brush; the sting is only slightly curved; there are 15 pectines; the pedipalpi are rather short, the hand a little longer than broad, with strong, granulate keels; fingers rather shorter than hand. Length $1\frac{1}{4}$ inch. From San Bernardino County, California.

***Isometrus maculatus* Linne**

This species occurs all through the tropics, and I have seen specimens from Santa Barbara and Santa Catalina Islands. It is a slender species with long tail, and more or less maculate with dark brown.

***Tityus tenuimanus* Banks n. sp.**

This species has been taken at Buena Vista Lake. It is yellowish brown in color. The pedipalpi are slender, the hand but weakly keeled and not granulate, the fingers fully one and a half times longer than hand, the eye-tubercle is broad, and the eyes large; from the tubercle is a row of granules each side to front margin, and on sides a row, indented behind and connected to opposite row near posterior edge of cephalothorax; the lateral ridges on first two segments are connected in front, the last segment has five rows of granules, the median not reaching behind, beneath the outer ridges are short; the tail is rather stout, the fifth segment with prominent serrate lower edges; no tooth below sting. Length 2 inches.

***Centrurus californicus* Wood**

This is a quite strongly granulate species, often showing two dark stripes on the body. It has been taken at Lake Tule, and in Lake County.

***Centrurus exilicauda* Wood**

This species is similar to the last, but more slender in all its parts, especially the palpi and tail. It is fairly common in Lower California, and has been taken near San Diego.